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ABSTRACT

New approaches are needed if educators are to deal successfully with the problem of teaching children to learn to read words well. Interesting questions come to the fore if those who seek solutions to this difficulty regard the reading of words as a subset of the wider problem of reading the class of visual signs in general, which includes (1) actions signs such as body language, and (2) object signs, as well as (3) symbols (such as words). As research deepens, it seems certain that ways to offer children learning experiences better suited to their needs must lie in the reservoir of visual language they have acquired. That a child thinks nonverbally, and can express himself well visually through cartoons, visual abstractions, pictures, etc., should be reason enough to give him this kind of opportunity to build his conceptual and interpretive skills. After that, adults can base efforts to improve his skill at reading aloud upon a better developed capacity for handling visual signs in communication. (Author/PB)

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SOME ASPECTS OF THE READING OF VISUAL LANGUAGES

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Educators and parents, as well as public officials, all across the United States appear to be becoming increasingly concerned with the failure of appreciable portions of our school populations to learn to read words well. Many are the conjectures and many the pieces of research that have been undertaken and carefully pursued in hopes of finding relatively simple single causes for this failure. Reluctantly, educators and all concerned appear gradually to be becoming adjusted to the idea that the causes are many and rarely simple.

Now, there is an air almost of desperation about those charged with the task of raising national reading levels. New approaches and new thoughts appear to be needed. Athey (1) speaking of these matters, observed that "reading is today the focus of interdisciplinary interest and effort." And then welcomes "this opening of windows to let more sunshine in."

This paper proposes merely to suggest the opening of another window. In doing so, we may discover that we are illuminating an even larger room than we supposed. For it is the conviction of the writer that the problems associated with learning to read words are part of a more general problem -- that of reading visual signs.

The expressions "visual sign" and "visual language" are used in the same approximate sense that they are used by Colin Murray Turbayne (28). Included are both natural signs and signs made deliberately for communication. The work of Ruesch and Kees (24) focuses on the everyday aspects of such communication and suggests that there are three categories, namely, action language, now called

body language; object language, that is, things that can be said by the use of objects; and special symbols. An integrated view of how body language, object language, and symbols are used in concert for intentional visual communication was presented by Debes (8) in an early article on visual literacy.

Is the reading of visual signs important to man? One needs only to consider the plight of the blind to be assured that this is so. Such common observations have an increasingly impressive array of research to support them. The eye appears to be equipped so that even in early infancy it can read visual signs that portend danger. The work of Rock and Walk (23) associated with the concept of THE VISUAL CLIFF is testimony to this. As visual perception develops, the capacity of the eye to read extremely subtle visual signs, surely an important attribute for survival, becomes sensitive to edges, outlines, changes, and differences in ways that have been discussed by Attneave (2).

But, let's now look at this "reading" of visual signs and see how the capacity arises and becomes important to all the various language activities of the child.....visual language, thinking, speaking, writing, and reading. Body language is the first "language" that an infant "reads." At first this body language is not visual but even more fundamental, that is, tactile. The physical comforts provided the infant by his mother speak to him of security and, in fact, provide him with his first successful experience in seeking and being rewarded; the hungry infant is encouraged by his mother's tactile language to hunt for her breast and, when he finds it, he

receives an oral and tactile reward. These are the first kinds of messages that a child receives and such messages, being profoundly related to survival, have the first meanings that a child dimly perceives.

It is meanings of these fundamental kinds that first concern the infant. Since his vision is excellent, and for assurance of this we can turn to the work of T. G. R. Bower (5), he soon learns to interpret the visual signs that have similar fundamental meanings for him. For instance, actions made by the youngster's mother in preparation for feeding can be well enough read by an infant so that, even though hungry and crying, he will stop crying. Mothers who know this place the infant where preparations can be observed. When this is done, the mother is relying upon the youngster's capacity to read a sequence of visual signs.

In the next phase, the youngster's capacity to read tactile and visual signs is entirely people-centered. He attempts to "read" the visual manifestations of the actions around him because the people around him are, during that period, his whole life. Consequently, he learns to smile when his mother smiles. He learns to open his mouth when he sees a spoon coming partly because what's in the spoon is food and partly because what's behind the spoon is mama. He learns to reach out for things handed to him partly because they are offered by his mother. And he can even learn, very early, to play games with his mother like peekaboo.

It is important to note that all of the foregoing is at a nonverbal level. The interdependencies of mother and infant lay

the basis for a rapid development of tactile and visual communication, and in normal situations, understanding and rapport. It is important to note, however, that there is a great deal of difference between what we are talking about here and the stimulus response kind of viewpoint. That difference rests in the fact that at each end of the communication line is a person anxious to be understood and to communicate. What's more, it is a person needing love and sharing love to the extent of its ability. The tolerance of a mother for infant ineptitude and her encouragement to the infant to try and try again until the desired response is obtained, is crucial to the youngster's survival, and to his later emotional and intellectual health. Montague's (17)explanation of these latter aspects is very persuasive.

It is also important to note that although we are talking, in part at least, about visual signs, we are talking about all kinds of signs. It is "not vision alone, but the whole person" that is involved in this kind of nonverbal communication. Byers (6), in speaking of these matters, emphasizes very strongly the importance of the human relationship in all communication as well as at this particular time.

EARLY READING OF BODY LANGUAGE

What the youngster notices and begins to "read" is action. Before he recognizes mother, or anything else, he recognizes process that ends in something important for him. As he becomes visually attuned to the signs around him, what he reads is now a linear thing, or an object thing, but a multidimensional context and

action kind of thing. It is patterns of movement with very few cues that he first reads successfully. Furthermore, these patterns are both spatial and temporal because the actions occur in both time and space. In other words, the character of this "passive" visual language (Debes opus cited) is multidimensional, nonlinear, nonverbal, and yet the child learns to "read" it.

LANGUAGE

Are we justified in regarding this reading of a passive visual language as indeed the reading of a language? Fodor and Katz (10) in their careful discussion of the structure of the semantic theory, said that "if speakers possess an ability that enables them to apprehend the structure of any sentence in the infinite set of sentences of a language without reference to information about settings and without significant variation from speaker to speaker, then that ability is properly the subject matter of a synchronic theory in linguistics." Because any number of viewers might see a well conceived set of visual signs and come to similar conclusions, and because such sets of visual signs are created often in our society, successful communication does become a legitimate concern of linguistic theory.

Furthermore, it has been often observed that, to begin to know a language, one must know the rules, but one need not know more than a small fraction of that language's vocabulary. Chomsky (7) and others have attested to this. So, although an infant does not come into the world with a visual vocabulary, he soon acquires a small one, learns how to "read it" and learns how to communicate with it.

All of this is possible because first, he can see well, and second, the meaning of the visual signs is in the context and the visual language (that is body language), used by his mother and others near him.

What we have been saying is that man uses body language signs and other visual signs as if they constituted the vocabularies of languages. We are asserting, consequently that there is an understood syntax and grammar behind such usage. Such a way of looking at language requires a somewhat different definition of language than many of us grew up with.

Are there really visual languages? The answer to that question is that there are many of them. The American Indians had a sign language that was transcontinental, crossing the barriers of spoken languages (27). The deaf have a sign language they call "signing" and a variant of that language called "signed English." These kinds of languages consist of body language signs that have generally agreed upon meanings (20).

Premack (21), discussing the implications of the language behavior exhibited by the Chimpanzee, Sarah, when she used specially made plastic symbols to make statements, said: "When does a piece of plastic cease to be a piece of plastic and become a word? We might answer, when it is used as a word: that is, when it occurs along with other words of appropriate grammatical class in sentences and when it occurs as the answer or part of the answer to questions. For example, we consider a small piece of blue plastic to be the word for apple because (i) it is used when, for example, the subject requests

apple and (ii) it is used by the subject to answer, "What is the name of apple?" We might add that the piece of plastic is a word when the properties ascribed to it by the subject are not those of the plastic itself, but those of the object it designates."

Premack then posed two alternatives: "in the course of acquiring language, the organism learns how to symbolize; symbolization is an integral property of perhaps all learning and makes language possible."

As Debes (9) has observed, in a child with normal sight, verbal language generally begins to develop on the base of the visual language that has already been developed. This is a very complex process. John Macnamara (16), speaking of language acquisition, asserts that infants learn their language by first determining, independent of language, the meaning which a speaker intends to convey to them, and then by working out the relationship between the meaning and the language. This is what occurs in the acquisition of visual language, the language acquired first. Macnamara, in discussing the puzzle of how the infant acquires verbal language, asserts that the grammar he uses "is not of Latin or any other language, but in some neurological code of which, as yet, not a single letter has been deciphered." Lacking the concept of the prior development of a visual language, Macnamara could hardly speak of it. The best developed study of body language and its importance in human interaction is by Birdwhistell (3).

As soon as a youngster has begun to develop a visual vocabulary and is able to read visual signs about him with reasonable

skill, it is possible for him to begin to link his visual language with the new verbal language he hears. This tends to occur, at first, in situations in which the mother deliberately uses visual language and verbal language simultaneously. For instance, she waves "bye-bye." That bye-bye is one of the first verbal acquisitions of many children is hardly surprising, since it has a conventionalized body language equivalent that a child can learn much earlier. Because of such parallelisms, a child rather quickly learns that he can translate from one language to the other and be understood in either language.

It is important to note here that much of the body language that the infant observes is unintentional body language. That is, the signs are usually not created explicitly to transmit an idea to the infant. Some are, of course. However, what the child comes to read fairly well is a great deal of unintended body language accompanied in a verbal home by a whole lot of meaningless sounds from the adults. The task of acquiring the verbal language is complicated by a number of factors, one of the most difficult of which is that the verbal language may be so abstract, and the referents so unsure. Also, speech is temporal. Its meaning is spread out over time. Furthermore, it is staccato, interrupted, and occurs without any apparent relationship to things going on that may have important meaning for the child. Verbal language is, furthermore, slow and inaccurate as far as the child is concerned. Compared to the visual language it must, to the child, seem very unreliable.

For instance, if the mother regularly gives the child things to drink from a blue glass, and says "yummy" each time, "yummy" may mean milk and blue for a long time...perhaps until the blue glass has orange juice in it. Then the meaning of both "yummy" and blue changes. An obvious conclusion one might draw from this is that at a later phase the child's mother might say "drink of milk" when the drink in the glass is milk, and "drink of orange juice" when the fluid in the glass is orange juice. In that way, the visual language and verbal language would at least be a little less contradictory. Despite these difficulties, by trying to read the primarily unintentional body language of his parents, and by trying to read the object language and context, the semantic content of these signs does become clear to the child. Then, as MacNamara says, he begins to attach the sounds that he hears with these meanings.

TELEVISION

Starting surprisingly early, infants can watch TV, and do. How does the image flow on TV resemble the flow of sounds and sights around the child at home? In both cases, the child has a visual language to observe. However, the visual language on the television screen is a language designed for communication. It may, therefore, be easily read once some of the signs begin to come through. It may be less difficult to deal with than the unintentional visual language the child encounters at home because there are fewer irrelevant signs in the TV messages. Much that is unnecessary and much that might be confusing or diverting is eliminated from the visual language of the screen. Consequently, once a child begins to "get the drift" he may read the language well.

But, beginning to get the drift of meaning in TV images presents problems, too. These arise because of several factors, the first and most important of which is that TV signs have no immediate direct affective consequences for the child.

In the past, how a child perceived an apple was a subject for psychological and educational investigation and conjecture. Researchers from vonSenden to Piaget have noted that when a person perceives an apple it acquires meaning according to the other experiences he has with the apple. VonSenden (30) proved that a person blind from birth, who knows through his tactile senses the difference between a cube and a ball, cannot, if suddenly given sight, tell the difference between the two. In order to make the differentiation, he must be able to feel them, too. Once he has both seen and felt the two objects, he can make the differentiation.

So, an object perceived by a child has little meaning until the child has a chance to touch, taste, or otherwise manipulate it. The apple of a child's eye may be an unpleasantly sour apple, a beautifully red apple, a pleasingly cool apple, etc. depending on whether he has been able to taste it, look at it, or feel it with his hands. It would surely have the most meaning if he had been able to eat it and thus satisfy a basic need.

But suppose the apple of his eye is only an apple in a snapshot? What meaning does this snapshot surrogate for the apple have for the child? Clearly, whatever that meaning may be, it is a long emotional step from the apple he could feel, taste, or eat. The apple in a snapshot can be handled as a snapshot but it cannot be a cool, tasty, or hunger-satisfying apple.

The child who has seen only a picture of an apple and is not acquainted with a real apple is hardly any better off than the child who has only seen the word "apple." Both have gotten acquainted with visual surrogates for reality, one more abstract than the other. In each case the child is presented with something that is not the referent and if this is occurring for the first time, he has no experience from which to evolve personal meaning except the context at the time.

If the child happens to have seen the printed word "apple" in connection with a picture of an apple, then he has perceived two surrogates for a "reality" he has not yet encountered. Since he has not encountered the "reality," and must depend on his own experience, he is justified in assuming that these signs are the realities. From a semantic viewpoint, we have presented him with surrogates for which there are no referents. Nevertheless. both the printed word "apple" and the photograph of the apple are important to the individual in that they will enable him to refer to the reality when he does encounter it.

With these thoughts in mind, let's look now at something that happens to about 98 percent of today's children. Let's suppose that an image of an apple presented to a child is not a color image but a black-and-white image on a TV screen. In this case it is not an apple that is red, tasty, or cold; it is merely a round mixture of greys and blacks and whites. This abstraction is even further removed from the reality than the color photographic print would be, because the color has been removed. This visual "map" abstracts even less from the "territory."

So, a child presented with strange experiences on the TV screen, unless he is familiar with the context of what he sees, is being told a story about something he had not experienced, in a spoken vocabulary unfamiliar to him. Nevertheless, we must note that a child who has a great many opportunities to sit and watch photo-visual presentations gradually does begin to understand what he sees. Since children today are often in homes where the television set is on almost continuously, and since the infant and young child are often before the TV set, the child may be exposed to many thousands of hours of opportunities to learn to "read" such signs, and to actually do so. That such opportunities usually have this consequence is consistent with the visual enrichment hypothesis and the hierarchy of propositions proposed by Williams (31).

The acquisition of the verbal sound signs is facilitated by the fact that the child has already acquired some visual language, and that translations back and forth between visual and verbal are so nearly equivalent in so many cases. It is also aided by the fact that the parallelism between visual language and verbal language lies linguistically at both deep and surface levels. At the deep level, the parallelisms are fundamental. Bolinger (4), speaking of deep structure, says "The existence of the verb and its maning is a deep fact; the form is only a surface fact and is irrelevant to the deep meaning." So, whether the child is offered,wordlessly, a spoonful of applesauce or hears the word "applesauce," may make almost no difference as long as either an applesauce-filled spoon, and the word "applesauce," are both familiar to him. As far as the child is

concerned, both the applesauce-filled spoon, and the word "applesauce" are action signs...predicate rather than noun or object...and action signs that have affective, physical, oral, and otherwise satisfying consequences.

THINKING

It is necessary, briefly, to discuss a few aspects of the nature of thinking. The first is that it is increasingly agreed that thinking is nonverbal. However, what "nonverbal" means depends on the theory, the research, and the researcher. Premack (21), speaking of the visual symbols he used with the Chimpanzee, Sarah, predicates a nonverbal thought process behind the innovative combinations Sarah was able to make. Simpkins (25) in his article on cognitive decoding says that thinking is nonverbal patterning. Randhawa (22) says merely that information is processed in a nonverbal mode. Peripherally supporting these two assertions is the general substance behind an article by Frostig (11) in which it is clear that she regards language as essential to thinking but, nevertheless, an acquired skill.

The nonverbal character of thinking is apparently closely related to some forms of verbal reading difficulty. For instance, there is evidence to show that about 30% of boys think more spatially than girls and that this "higher," more spatial thinking correlates closely with reading failure. In other words, the more three-dimensional and nonverbal a child's conceptual capacity may be, the greater his likelihood of having problems with reading. This study by Dr.Jean Symmes (26) of The National Institute for Mental Health is recent and has not yet been replicated.

TESTS

An unfortunate aspect of all our conjectures and research about thinking has been the problem of testing. Because, to adults, words seemed so easy to use in most kinds of situations, and because visual technology had not been well-developed, whenever we wanted to know if a youngster had learned something, it seemed convenient to find out by a verbal test. What we were requiring when we did so was a translation from one of the visual languages to one of the verbal languages, or from a tactile or proprioceptive analogue to a verbal analogue. What we have not, apparently, recognized is that the skills of translation might not be there. Tuttle (29) in an early visual literacy experiment learned that children below the age of six may have to be taught to translate picture statements into verbal statements. Randhawa showed that even young people of college age, if presented with a nonverbal problem, can demonstrate their understanding far better nonverbally than verbally.

In recent times efforts to provide youngsters with opportunities to react to test situations with visual language or body language have increased. Although they would not say what I am about to say with the same choice of words and concepts, educators in all walks of life, and increasingly in the field of testing, are becoming aware of the fact that a child's capacity for reading language and his capacity for creating visual language on demand may, thanks to television, be quite well developed. Consequently, those visual capacities may be a far safer means of gauging a youngster's progress than the verbal mode. Thanks to television and

to the proliferation of visual communication techniques, by the time a youngster comes to school he may know many of the visual signs systems categorized on the chart provided as Exhibit 1.

SPEAKING

As mentioned above, speech is spread out temporally. Yet, for the infant speaking his first words, it need not be spread very long. Speech can be the utterance of one word and all the youngster's intended meaning may be transmitted thereby. What the youngster relies on, often, is the rest of the visual context, and a few of his own body language signs. The child who whines and points toward a milk bottle is probably getting his message across, and the "speech" portion is certainly spread out over very little time.

Speech, somewhat like the visual sequential or string languages, rests on a skill in generating sign or symbol sounds, arranging them in conventional sequences with the intent of conveying meaning by metaphor. If a youngster has acquired a good reservoir of visual language, and has, thereafter, begun to acquire also a "passive" verbal vocabulary, then any effort to speak can rest upon both the visual signs and the somewhat-matching verbal signs. During the period each language is developing, a youngster may be encouraged to act out the body language for what he means as well as say what he means. This has the benefit of providing proprioceptive, semantically relevant experience, but also of permitting the youngster to see his own body language while he hears the sounds. By doing these things he can deepen the base upon which his new sounds rest. It is important to remember that each time a person makes a sound with meaning intended, he changes himself.

Change in favorable directions can often occur because motor activity tie-ins can be arranged. This is partly because, as Geschwind and others have observed, the motor areas and speech areas of the brain lie close together and are rather closely linked. (13)

One of the best bases for building a child's speech is to permit him to take pictures and to talk about his pictures. This has a considerable number of directly and indirectly related advantages. Research by Griffith (14) and others has shown that a great deal more verbal articulation occurs if a child has opportunities to talk about a picture he has made himself than can usually be evoked with any other kind of stimulus. One reason for this is that, by having the picture in front of him, a child has a physical, visual basis for organizing his talk. In fact, that organization can rest upon a carefully considered visual plan made possible through picture arrangement. In other words, the picture base makes it possible for the child to feel more sure about his thoughts before speaking. Having such a base can be extremely important to a child: Moffett (18) has observed that, "Speaking and writing are essentially just editing and abstracting some version of what at some moment one is thinking." Editing and abstracting from a picture series he has arranged in a meaningful way himself, is apparently advantageous to a child.

An emphasis on speaking is important and may be crucial to the development of reading as many have observed. Learning occurs when the child is able to reconstruct within his own being aspects of what he must learn. Speaking about somethings that concerns him, such as a set of

visuals in the form of pictures or cartoons, not only helps the child develop a verbal vocabulary by talking, but making various utterances, using that vocabulary over and over again, lays a fine basis for reading those same words.

One reason that this works is that speaking is a temporal kind of thing, and that reading is a temporal kind of thing too. Speech, however, is purely temporal; speech is not spread out in space, or on a surface, but reading is.

READING

Reading written or printed words is facilitated by, but not dependent upon, heard language. (The Rosetta Stone was "read" even though the sound of the related language was unknown to the readers). Spoken and written languages are two different languages, although related, and the child must actually translate between them. Since heard language and spoken language are temporal and, in that sense, linear, they have something in common with a printed or written language that is spread out upon a page in a linear fashion. Written or printed words do not, however, have a temporal feature. They have a spatial one instead. In fact, the space taken upon a page by written or printed words is a substitute for the time consumed in speaking the same words. The space consumed is a metaphor for the time consumed. That, in teaching children to read, we expect them to readily understand that we are substituting space for time as well as a visual code for spoken sounds may be far more naive than we have supposed.

One way to help the child to make these translations is to give him the opportunity to use visual language units. Linear sequences of pictures can be regarded as linear sequences of individual visual utterances. If these visual utterances are arranged left to right on a table, the youngster can "read" the picture sequence much as he reads a sentence. The fact that the pictures are arranged left to right helps him to move left to right with his eyes and to deal more comfortably with the convention that in English we usually arrange words sequentially from left to right. This left to right pattern is usually established early and is part of our fundamental perceptual preferences according to Gaffron (12) and Williams (31).

Reading aloud seems a natural enough, and logical enough, outgrowth of speaking aloud so that all of us tend to try to have children do it when they are new at reading. However, we might be better off trying other approaches. For instance, after a youngster has read something we wanted him to read, we might ask him to select something from somewhere according to instructions in what he read. If we have sets of pictures around, especially story-telling sequences, we might base questions the child must read verbally on such picture sets, and make his arranging pictures his proof that the reading material was understood.

If we proceed in this way, we are avoiding having the youngster translate from the page of the printed material into the primarily visual language base for semantic meanings in his head, and then as a second

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step translate again from his ideas to spoken words. Instead, we ask him to move from the visual language base in his mind, to picture surrogates for that visual language. This is a simpler step. That it is so, accounts for some of the pleasure children manifest in doing it, and for the successful reading programs built upon variations of this idea, such as those reported by Hefernan-Cabrera (15) and Nuell. (19)

CONCLUSION

Insights into the problems of reading visual language of all sorts need to be much deepened by conjecture study, and research. A tremendous number of subtle and interesting questions come to the surface when we look at the problems associated with the reading of words as part of the more general problem of the reading of visual signs. As research deepens in these fields, it seems certain that ways to offer children learning experiences better suited to their needs must lie in that reservoir of visual language the child has acquired. That a child thinks nonverbally, and can express himself well visually through cartoons, visual abstractions, pictures, etc, should be reason enough for us to give him this kind of opportunity to grow his conceptual and interpretive skills. After that, we can base efforts to improve his spoken verbal reading skills upon a better developed capacity for handling visual signs in communication.

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CATEGORIES OF VISUAL -- AUDIAL SIGNS

Abstractions (Metaphors*) Generated To Transmit Meaning

Natural (Unintentional) Analogs	First Generation (Thoughts Represented Directly)			Derived+ Generation		
	String	Simultaneous	Pattern	String	Simultaneous	Pattern
Seen aspects of objects	Body language	Ballet	Mapping	Cartoon sequences	Two or multi-screen	Display Collage
Seen aspects of actions	Mime	Drama	Design Painting	Composed sound	Divided screen	Picture patterns
Heard sounds	Signing (deaf)	Music (multi-voice)	Sculpture	Still picture sequences	Sound slide	Overlapped multi-screen images
Smelled odors	Music (one instrument)	Opera	Graphs	Silent motion pictures	Sound movie	
Felt tactiles	Symbols	Hawaiian Japanese**	Diagrams	Writing		
Observed body language	Object language	Object language	Object language	Printing		
	Spoken language		Architectural drawing	Braille		
				Finger spelling		
	Measuring			Morse Code		
	Mathematics	Mathematics	Mathematics	Wig-Wag (flag code)		
	Chinese			Drum talk (simulated word sounds)		
	Japanese			Written or printed music		
	Flag codes (weather, etc.)					
	Computer languages					

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John Debes

*Either conventional or contrived.
**And other symbolic dance.

+Systems that developed from first generation systems at least in part.